REMARKS

Summary of Amendments

Claim 1 has been amended to recite the claim 5 limitation that the claimed susceptor is made "of a ceramic whose thermal conductivity is 100 W/mK or more," and the claim 7 limitation that the claimed metal plate has "a thermal conductivity of 100 W/mK or more." Accordingly claims 5 and 7 have been canceled, and the dependency of claims 6 and 8, which formerly depended on claims 5 and 7 respectively, has been amended. Claims 1-4, 6, and 8-14 thus remain pending in the present application.

Rejections under 35 U.S.C. § 103

Claims 1-14; Kholodenko et al. '755 or Kadomura et al. '273 in view of Hiramatsu et al. '006 or Ito et al. '116

Claims 1-14 stand rejected as being unpatentable over U.S. Pat. No. 6,310,755 to Kholodenko et al. or U.S. Pat. No. 5,968,273 to Kadomura et al., in view of U.S. Pat. No. 6,507,006 to Hiramatsu et al. or U.S. Pat. No. 6,717,116 to Ito et al.

In the first paragraph at the top of page 3, the current Office action alleges that the thermal conductivity of the ceramic of which the susceptor recited in claim 1 of the present application is composed is taught by Kholodenko et al. or Kadomura et al.

Nevertheless, Applicants respectfully assert that Kholodenko et al. make no mention of the thermal conductivity of the ceramic material of the electrostatic member 100—which apparently is being read by the Office as an analogue of the ceramic susceptor 1 described in the present specification—of their electrostatic chuck 55. (The discussion of thermal conductivity in Kholodenko et al. is limited to that of the aluminum-infiltrated, silicon carbide base 175 of the electrostatic chuck 55, and to that of the metal bond layer 250, of the ceramic support 190, and of the refractory metal electrode 105.)

Applicants likewise assert that although Kadomura et al. mention that the aluminum nitride plate 6—which apparently is being read by the Office as an analogue of the ceramic susceptor 1 described in the present specification—that composes their electrostatic chuck 3 has a thermal conductivity of 0.235 cal/cm × sec × °C (= approx. 98 W/mK), no mention is made of a thermal conductivity of 100 W/mK or more.

In the embodiments set forth in the description section of the present specification, distinct from the teachings of either Kholodenko et al. or Kadomura et al., the effectiveness of ceramic susceptors utilizing a ceramic material whose thermal conductivity is 100 W/mK or more is brought out clearly.

Claim 1 has been amended to recite:

> a ceramic susceptor of a ceramic whose thermal conductivity is 100 W/mK or more, said susceptor having a retaining side for retaining an object to be processed;
>
> a resistive heating element incorporated in said susceptor, said resistive heating element patterned in a circuit having a pattern spacing of 0.1 mm or more; and
>
> a heat-reflecting metal plate having a thermal conductivity of 100 W/mK or more, said metal plate arranged on said susceptor opposite said retaining side, for promoting diffusion of heat from said resistive heating element toward said retaining side.

It is respectfully submitted that a semiconductor/liquid-crystal device fabrication holder as now recited in claim 1 presents a novel combination not obvious from the references cited by the Office in making the present rejections.

In the first place, neither Kholodenko et al. nor Kadomura et al. explicitly teaches a ceramic susceptor and a *heat-reflecting* metal plate whose thermal conductivities are as specifically recited in claim 1 of the present application. In the second place, both of these two references are silent as to specific dimensional features of the heaters employed in the devices that the references teach, whereas claim 1 of the present application in contrast recites a resistive heating element "patterned in a circuit having a pattern spacing of 0.1 mm or more."

It is respectfully submitted that the novel combination, now recited in claim 1, of a ceramic susceptor of the given thermal conductivity, a resistive heating element dimensionally configured in the given predetermined pattern, and a heat-reflecting metal plate of the given thermal conductivity leads to the superior susceptor-temperature uniformities set forth in the tables in the present specification. In particular, the temperature uniformity achieved in Embodiments 1-3 and 5-7 in the present invention was very nearly or better than ± 0.5%. In contrast, the only mention that Kholodenko et al. make of temperature regulation is in column 10, lines 32-38, where they state,

> [T]he embedded heater 235 can maintain the substrate 30 in a small range of temperatures with more accuracy and stability than that obtained by radiative heating, because the thermal mass of the base

> 175 and the dielectric 115 serve as heat sinks that prevent localized temperature fluctuations from excessively changing the temperature of the substrate 30.

"Preventing localized temperature fluctuations" is a far cry from the temperature uniformity of better than ± 0.5% achieved by the present invention.

The Kadomura et al. teachings on temperature regulation are likewise in stark contrast to the temperature uniformity that can be achieved by a holder as now recited in claim 1 of the present invention. The following passage at lines 47-57 in column 9 of Kadomura et al. is illustrative.

> Concretely, by heating the wafer W [to] a temperature more than the setting value [with] the heater 7 integrated [in] the electrostatic chuck 3[,] and simultaneously suppressing the degree of heating for the wafer W by canceling, using the temperature adjusting jacket 2, the thermal energy given by the heater 7 in excess of the setting temperature, it becomes possible to stably adjust the temperature of the wafer W at the setting value.

The Kadomura et al. teachings are directed to wafer temperature adjustment that is carried out *while the wafer is being processed.* The temperature-uniformity goal that Kadomura et al. state they achieve is merely stable *adjustment* of the wafer "at the setting value." Thus, not only do Kadomura et al. never give any specifics as to how close to the "setting value" their technology is able to maintain their wafer stage, but also, they are completely silent as to *inherent* temperature uniformity of their device in the absence of the temperature-adjusting regime they prescribe.

Meanwhile, Hiramatsu et al. or Ito et al. have been recited with respect to claim 1 to reject the limitation therein that "said resistive heating element [is] patterned in a circuit having a pattern spacing of 0.1 mm or more."

Nevertheless, it is respectfully asserted that the Office has made no *prima facie* showing of a motivation to combine the teachings of either Kholodenko et al. or Kadomura et al. with those of either Hiramatsu et al. or Ito et al. As argued above, Kholodenko et al. and Kadomura et al. are silent as to how temperature uniformity to the extent accomplished by the present invention might be achieved by their respective technologies. Consequently, in the first place a skilled artisan having familiarized himself with either the Kholodenko et al. or the Kadomura et al. reference would not be motivated to seek to achieve the temperature uniformity attainable by the present invention.

At the bottom of page 2, the Office action states that it would have been obvious to one of ordinary skill in the art to adapt the Kholodenko et al. and

Kadomura et al. devices with the heater circuit patterns disclosed in Hiramatsu et al. or Ito et al. "not only to prevent a short circuit between the heating pattern but also to provide an adequate spacing to incorporate the through holes for lifting pins or the holes for displacing thermocouples therein."

Nevertheless, it is respectfully submitted that this motivation to combine the cited references could never produce the synergistically resulting temperature uniformity achieved by the novel combination now recited in claim 1, namely:

> a ceramic susceptor of a ceramic whose thermal conductivity is 100 W/mK or more, said susceptor having a retaining side for retaining an object to be processed;
> a resistive heating element incorporated in said susceptor, said resistive heating element patterned in a circuit having a pattern spacing of 0.1 mm or more; and
> a heat-reflecting metal plate having a thermal conductivity of 100 W/mK or more, said metal plate arranged on said susceptor opposite said retaining side, for promoting diffusion of heat from said resistive heating element toward said retaining side.

Lastly, it is respectfully submitted that claims 2-4, 6, and 8-14 as depending from an allowable base claim 1 should in turn be held allowable.

A response to this Office action was due by July 19, 2005. Together with their reply submitted August 19, 2005—which did not put the application in condition for allowance—Applicants have previously submitted and paid for a petition for a one-month extension of time, which was granted and entered. Since the six-month statutory deadline for responding to the action expires on October 19, 2005, a further petition, along with a credit-card payment authorization form for the fee due for the additional two-month extension, is attached hereto. Please consider this amendment as timely filed.

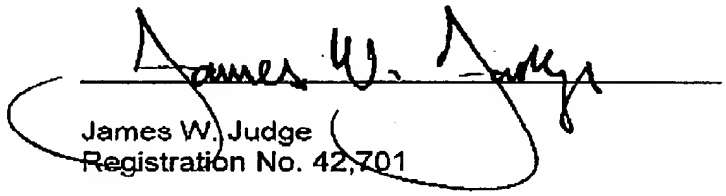
The present reply and amendment are being submitted with a Request for Continued Examination. The advisory action mailed September 27, 2005 in the instant application indicated, as just noted, that Applicants' amendment submitted August 19, 2005 did not put the application in condition for allowance, but would be entered for purposes of appeal. Nevertheless, non-entry of Applicants' amendment filed August 19, 2005 is hereby requested in order that the present amendment being submitted together with the RCE supersede the previous reply.

App. No. 10/708,301
Amendment dated October 18, 2005
Reply to Office action of April 19, 2005

Accordingly, Applicants courteously urge that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

October 18, 2005



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